Polymer nanoneedle-mediated intracellular drug delivery.

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Public Summary:
Delivery of drugs into the cellular cytoplasm of target cells represents a major hurdle in treating various diseases. This challenge can be addressed by encapsulation of drugs onto or within nanoparticles, which can then be targeted to diseased cells. Here, needle-shaped particles are shown to exhibit substantially higher cytoplasmic delivery of drugs such as siRNA compared to their spherical counterparts. Furthermore, these needles are designed to lose their sharp tips over time and can render themselves ineffective over time, thereby offering control over their duration of activity and toxicity. Such polymer nanoneedles open new avenues for delivering drug molecules directly into the cytoplasm with low toxicity.

Scientific Abstract:
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